REMARKS

This amendment is responsive to the Official Action dated June 16, 2003.

Extension of Time:

A petition for extension of time of 2 months is enclosed herewith.

Pending claims:

Claims 1 - 55 were pending in the application.

No claims were allowed.

By way of this amendment, the Applicant has amended claims 30 and 34.

Claims 1-55 remain pending in the application.

Claim Rejections under 35 USC §112, second paragraph:

Claim 30 was rejected under 35 USC §112 as being indefinite. Claim 30 has been amended to depend from claim 28 and the language has been changed to clarify the intended meaning of the claim.

Claims 34 and 35 were rejected under 35 USC §112 as being indefinite.

With regard to claim 34, the Examiner objected to "said method" as recited in line 1 of the claim. Claim 34 has been amended to depend from claim "33" rather than claim "23". This amendment should remove the noted deficiency.

With regard to claim 35, the Examiner objected to "said second communication module" in line 4 as having no antecedent basis. Applicant requests reconsideration in that "a second communication module" is defined in line 2 of the claim.

Claim Rejections under 35 USC §102(e):

Claims 1-9, 14, 33, 35-51 and 53 were rejected under 35 USC §102(e) as being anticipated by the US Patent to Doerr et al 6,304,350.

Applicant respectfully disagrees and requests reconsideration.

The present invention takes advantage of arrayed VCSEL and photodetector devices to provide a high density point-to-multi-point telecommunication system.

In the past, there have been many distinct types of systems for communicating data from point-to-point in a communication system. The earliest basic arrangement involved a single transmitter/receiver pair linked to another single transmitter receiver pair to form a bi-directional link. Typically, the transmitter and receiver were mounted on the same interface card, but were not generally integrated together as a single unit. Individual fiber optic cables were connected between the transmitter of one pair and the receiver of the other pair and vice versa. As one can appreciate, these point to point links take up significant rack space.

Transceiver systems later evolved wherein the transmitter and receiver were integrated together in a single pluggable unit. The transceiver units significantly reduced rack space as multiple transceiver sockets could be mounted on a single card. The fiber optic cables were also coupled together as a duplex cable to simplify connections. These transceiver systems are still typically used in point-to-point communication systems, i.e. transmit/receive to/from one location to another location.

Another communication system arrangement that evolved included parallel optical interconnects in which a plurality of transmitters and a plurality of receivers were connected together with a 12 fiber ribbon connector known as the MTP (MTP is a registered TM of US Connec, Ltd.) connector. The MTP connectors simplified the use of multiple transmitters to transmit multiple parallel streams of data to another single location. These parallel transmission systems increased point-to-point bandwidth by providing additional channels over which to send data. Bits of data were transmitted and received in parallel fiber channels. Accordingly, all of the fibers originated at one location and terminated in another location to provide a single high bandwidth transmission system.

As various types transmission systems evolved so did varying types of communication protocols (standards). For example, there are multiple different communication standards currently used by vendors for different transmission systems, all having varying speed and distance limitations. An important issue that arises with varying communication standards is that each standard typically requires its own rack system with electronics suited for transmitting/receiving that particular protocol.

The present invention seeks to reduce rack space, compl xity and infrastructure requirements by providing a VCSEL/photodetector array system having the ability to

generate/receive a different communication protocol (standard) at each VCSEL/photodetector of the array. Improving on the parallel optical systems which transmitted a single data signal broken up into multiple parts and in parallel over multiple fibers, the present system creates an independent signal path on each fiber of the array. A simple comparison is that the old parallel interconnect systems used the 12 fiber MTP to transmit/receive one data signal between point A to point B, whereas the new system generates/receives 12 independent data signals which can travel from point A to points B-M, or receive 12 independent data signals from points B-M back to point A. The invention as presented herein implies that the VCSEL/photodetector arrays include the integrated electronics to transmit/receive the various different standards/protocols to be used with the system.

Turning to the present invention, claim 1 as filed reads as follows:

> 1. A fiber optic communication assembly, comprising:
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> an optical communication module having a plurality of at least three fiber optic ports, said plurality of fiber optic ports being configured as an array, at least a first one of said plurality of fiber optic ports being signal-independent from at least a second one of said fiber optic ports;
>
> a plurality of fiber optic conductors each having a first end and a second end providing an optical communication path therebetween, each of said plurality of fiber optic conductors being coupled at its first end to one of said plurality of fiber optic ports, said first ends of said plurality of fiber optic conductors being disposed in adjacent parallel relationship at said plurality of fiber optic ports;
>
> wherein a first one of said fiber optic conductors is coupled to said first one of said plurality of fiber optic ports to form a first signal-independent optical communication path, and wherein a second one of said plurality of fiber optic conductors is coupled to said second one of said plurality of fiber optic ports to form a second signal independent optical communication path; and
>
> wherein said second end of said first fiber optic conductor is configured to be disposed in remote physical relationship to said second end of said second fiber optic conductor.

The claim thus recites a plurality of optical ports, first and second signal independent communication paths and that the second ends of each path are physically remote from each other.

Claims 1-9, 14, 33, 35-51, 53 were rejected under 35 USC §102(b) as being anticipated by the US Patent to Doerr No. 6304,350. Doerr discloses a waveguide grating router which de-multiplexes WDM signals from a single fiber to multiple fibers. A multi-frequency laser generates a wavelength spectrum effective for carrying a WDM signal over a single fiber. At the termination location, a waveguide grating router de-multiplexes the WDM signal into its individual wavelengths for processing. While there are some similarities in structure, there are several distinctions which would not anticipate claim 1. Firstly, the receivers 131, 132 at the terminating ends of the fibers are not physically remote from each other as defined within the context of the present specification. Remote physical relationship is intended to mean different locations, i.e. different rooms of a building, different floors of a building or different buildings altogether. In Doerr, the WDM signal is received at a terminating location, and then the signal is de-multiplexed and provided to multiple receivers, which are all located at the same terminating location, usually within the same rack. Accordingly, the ends of the optical communication paths are not disposed in remote physical relation as required by the claim.

Dependent claims 2-9 define additional features which are also not anticipated by Doerr. For example, as recited in claim 5, each of the communication paths is configured to communicate a plurality of WDM signals. The optical communication paths 104, 105 in Doerr are already de-multiplexed by the waveguide grating router, and thus the individual paths are not configured to communicate WDM signals.

> 5. (original) The fiber optic communication assembly of claim 1, wherein at least one of said first or second signal-independent optical communication paths is configured to communicate a plurality of multiplexed optical signals using wavelength division multiplexing.

Claims 6-9 define that each optical communication path is compliant with a different standard, i.e. each path is independently operating on a different communication standard and each operates independently from the other.

> 6. (original) The fiber optic communication assembly of claim 1, wherein said first optical communication path comprises a first standards-compliant optical communication path, and
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> wherein said second optical communications path comprises a second standards compliant optical communication path.

7. (original) The fiber optic communication assembly of claim 1, wherein said first optical communication path is compliant with a first standard, and

wherein said second optical communications path is compliant with a second standard, said first and second standards being different from each other.

8. (original) The fiber optic communication assembly of claim 1, wherein said optical communication module comprises at least one of an optical communication transmitter module, an optical communication receiver module, or an optical communication transceiver module.

9. (original) The fiber optic communication assembly of claim 2, wherein said optical communication module comprises an optical communication transmitter module, each of said plurality of fiber optic ports coupled to a separate signal-independent transmitter; or

wherein said optical communication module comprises an optical communication receiver module, each of said plurality of fiber optic ports coupled to a separate signal-independent receiver; or

wherein said optical communication module comprises an optical transceiver module, each of a portion of said plurality of fiber optic ports coupled to a separate signal-independent transmitter and each of the remaining portion of said plurality of fiber optic ports coupled to a separate signal-independent receiver.

In contrast, Doerr discloses de-multiplexing a single WDM signal into its individual wavelength signals. As is well known, the WDM signal is generated according to one standard. Accordingly, each of the de-multiplexed wavelengths in Doerr is compliant with the same standard. The signals traveling on fibers 104 and 105 are thus compliant with the same standard, not independent standards as claimed.

This point is actually fairly important in the context of reducing rack system space and infrastructure needs. The fact that the present system integrates multiple different standards generating/receiving capabilities into a single array module can significantly reduce the required infrastructure at a single location. By generating/receiving separate and independent standards compliant signals from one module, the operator can eliminate separate rack systems for each of the standards as previously required.

The same arguments apply to the equivalent method claims 33, 35-51 and 53 in that they also define the same structural and functional standards independent relationships between the arrays.

Claim Rejections under 35 USC §103:

Claims 10-11, 25, 26 and 30 were rejected under 35 USC §103 as being unpatentable over Doerr in view of Swirhun.

The Applicant respectfully requests reconsideration in light of the arguments set forth above with respect to Doerr.

The arguments set forth above with respect to Doerr are repeated herein. Swirhun discloses a parallel optical interconnect using an array of 850nm VCSELS and an MTP 12 fiber bundle to transmit one signal from point A to point B. Each fiber transmits a parallel portion of the signal. Swirhun does not disclose nor teach nor suggest, the provision of a VCSEL/photodetector array wherein each optical communication path is operated accordingly to a different communication standard and wherein each optical communication path can terminate independently in a different physical location. Rather Swirhun discloses the standard prior art parallel optical interconnect wherein the 12 fiber MTP is used to communicate a single data stream from point a to point B.

Claims 12 and 27 were rejected under 35 USC §103 as being unpatentable over Doerr and Swirhun as applied to claim 11 above, and further in view of Giebel (MTP connector).

The Applicant respectfully requests reconsideration in light of the arguments set forth above with respect to Doerr and Swirhun.

Claims 13, 15-24, 28-29, 31-32, 34, 52, 54 and 55 were rejected under 35 USC §103 as being unpatentable over Doerr.

The Applicant respectfully requests reconsideration in light of the arguments set forth above with respect to Doerr as applied to claims 1-9, 33, 35-5 and 53.

Accordingly, claims 1-55 are believed to define subject matter which is patentably distinguishable over the cited prior art of record.

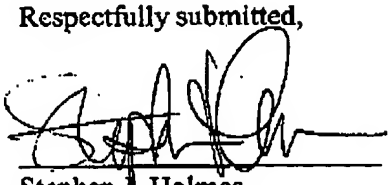
Claims 1-55 are thus believed to be in condition for allowance and the application ready for issue.

Corresponding action is respectfully solicited.

Serial No. 10/087,648

PTO is authorized to charge any additional fees incurred as a result of the filing hereof or credit any overpayment to our account #02-0900.

Respectfully submitted,



Stephen J. Holmes
Reg. No. 34,621

BARLOW, JOSEPHS & HOLMES, Ltd.
101 Dyer Street
5th Floor
Providence, RI 02903
401-273-4446 (tel)
401-273-4447 (fax)